

論文 / 著書情報
Article / Book Information

題目(和文)	
Title(English)	The Exploration of Uncanny Valley and Influence of Robot ' s Nonverbal Behaviours Toward Likability in Human-robot Interaction
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出典(和文)	学位:博士(学術), 学位授与機関:東京工業大学, 報告番号:甲第10901号, 授与年月日:2018年3月26日, 学位の種別:課程博士, 審査員:三宅 美博,寺野 隆雄,中村 清彦,出口 弘,小野 功
Citation(English)	Degree:Doctor (Academic), Conferring organization: Tokyo Institute of Technology, Report number:甲第10901号, Conferred date:2018/3/26, Degree Type:Course doctor, Examiner:,,,,
学位種別(和文)	博士論文
Category(English)	Doctoral Thesis
種別(和文)	審査の要旨
Type(English)	Exam Summary

(博士課程)

論文審査の要旨及び審査員

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論文審査の要旨 (2000 字程度)

The title of this thesis is “The Exploration of Uncanny Valley and Influence of Robot’s Nonverbal Behaviour toward Likability in Human-robot Interaction”. This thesis presents an exploration of Uncanny Valley from the viewpoint of robot’s nonverbal behaviour. The main aim is to explore the existence of Uncanny Valley from a viewpoint of robot’s nonverbal behaviour. It consists of six chapters.

In Chapter 1: Introduction, the author summarized general background of the investigations on Uncanny Valley effect in current studies and pointed out that the majority of the current studies mainly focus on the influence of robot’s appearance. Furthermore, the author indicated that the focus only on the influence of robot’s appearance leaves a big missing part, which is the influence of robot’s nonverbal behaviour and it can impede the complete exploration of Uncanny Valley. Thereafter, the author puts forward the necessity of the investigation from a viewpoint of robot’s nonverbal behaviour.

In Chapter 2: The Importance of Nonverbal Behaviour in Human-human Interaction, the author explained an experiment in human-human interaction aiming to assert the importance of nonverbal behaviour in the interaction by investigating the relationship between human’s internal state (prior knowledge) and interactional behaviours (mutual gaze convergence and head nodding synchrony) in short lecture task. The author found that prior knowledge facilitates mutual gaze convergence and head nodding synchrony with different temporal range and there is a relationship between human’s internal state and nonverbal interactional behaviour. The author also indicated that nonverbal behaviour is worth consideration for robot’s nonverbal behaviour design to enhance human’s likability in human-robot interaction.

In Chapter 3: The Influence of Robot’s Nonverbal Behaviour toward Human’s Likability, the author continued the investigation on human-robot interaction focusing on robot’s nonverbal behaviour. The author aimed to investigate the influence of robot’s nonverbal behaviour (gaze and head nodding) toward human’s likability. In this experiment, the author found that there is an influence of robot’s nonverbal behaviour toward human’s likability, which is really expressed via their nonverbal interactional behaviours (mutual gaze convergence and head nodding synchrony). According to the finding, the author affirmed that robot’s nonverbal behaviour has impact on human’s likability toward the robot in human-robot interaction.

In Chapter 4: The Exploration of Uncanny Valley in Robot’s Nonverbal Behaviours, the author further extended the investigation with more variety of robot’s nonverbal behaviour combinations to explore the Uncanny Valley from a viewpoint of robot’s nonverbal behaviour. In this experiment, the author asked the participants to rate human-likeness and affinity of robot’s nonverbal behaviours. The

result reveals a biphasic relationship between human-likeness and affinity ratings, which demonstrates a curve resembling the Uncanny Valley. The author reported and provided an evidence indicating the existence of Uncanny Valley from a viewpoint of robot's nonverbal behaviour.

In Chapter 5: General Discussion, the author discussed that the Uncanny Valley detected in robot's nonverbal behaviour is context-dependent. The author indicated that, in giving a talk context, robot's head nodding behaviour with no gestures presents context-behaviour mismatch, which violates humans' expectation and leads to double bind situation, and is prone to fall into the Uncanny Valley. The author also suggested that gestures should be considered as a fundamental element of robot's nonverbal behaviour.

In Chapter 6: Conclusion, the author summarized that robot's nonverbal behaviour affects human's likability toward the robot in human-robot interaction and the Uncanny Valley does also exist from a viewpoint of robot's nonverbal behaviour.

In summary, this thesis addresses the importance and influence of robot's nonverbal behaviour in human-robot interaction and provides an evidence indicating the existence of Uncanny Valley, which can be considered as the first finding of Uncanny Valley from a viewpoint of robot's nonverbal behaviour. Therefore, we agree that this thesis meets the criteria to complete the degree of Doctor of Philosophy.

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